REMARKS

Claims 1-7, 9-11, and 13-19 are pending and stand rejected.

Claims 1-5, 7, 9-11 and 13-19 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the document Sensors and Actuators by Martin et al. ("the Martin reference") in view of United States Patent No. 4,922,745 to Rudkin et al. ("the Rudkin reference"), United States Patent No. 5,337,605 to Schultz et al. ("the Schultz reference"), and United States Patent No. 6,479,763 to Igaki et al. ("the Igaki reference"). Applicants respectfully submit that the rejection should be withdrawn in view of the following explanation.

The Martin reference discloses a **non-immersible monolithic sensor** to measure liquid density and viscosity. (Martin, Fig. 8). The monolithic sensor disclosed in the Martin reference is not immersed in the liquid during the measurement of the liquid. Instead, the monolithic sensor disclosed in the Martin reference seals the liquid to be measured in a container. As acknowledged by the PTO, the Martin reference does not disclose an immersible container that encloses the piezoelectric sensor. *(See* Office Action, April 4, 2003, pg. 3).

In the present action, the Examiner asserts the following:

> Figure 8 show the device with a base with connectors and sensors. The base portion may be considered a bottom. The sensor resonance frequency changes "with liquid immersion." This is considered equivalent to an immersible container being immersed in the liquid during a measurement of the property of the liquid as in the instant invention. Texture on the resonator is shown to completely cover the sensor surface so Examiner considers the resonator may be completely immersed in the liquid during the measurement of the property of the liquid." *Office Action*, May 5, 2004, pg. 3).

It is respectfully submitted that the Martin reference does not disclose that "the sensor resonance frequency changes 'with liquid immersion,'" as asserted by the Examiner. The monolithic sensor disclosed in the Martin reference is the entire device depicted in Fig. 8. (Martin, Fig. 8). This monolithic sensor includes two thickness-shear mode (TSM) resonators. While the Martin reference describes the TSM resonators being in contact with the liquid while it is being measured, Martin does not disclose any portion of the monolithic sensor being immersed in the liquid. As illustrated in the Martin reference, the base portion operates as a vessel for retaining the liquid being measured and as a complete barrier to anything surrounding the sensor. This configuration is not equivalent to the system described in Claim 1.

According to Claim 1, an immersible container encloses a piezoelectric sensor device and has at least one of a liquid inlet and liquid outlet. During a measurement of a liquid, the

immersible container is immersed in the liquid being measured. The liquid inlet and/or liquid outlet provide ingress and egress for the liquid to come into the container and thereby immerse the piezoelectric sensor device in the liquid being measured. Thus, both the container and the piezoelectric sensor device are immersed in the liquid during a measurement of the liquid. This configuration is contrary to the teaching of the Martin reference.

According to the Martin reference, only the TSM resonator is immersed in the liquid. Since the immersible container recited in claim 1 has at least one of a liquid inlet and liquid outlet that allows the measuring liquid to enter the container, and since the base depicted in the Martin reference does not, the immersible container of claim 1 and the base of Martin cannot be considered equivalent structures. Thus, the Martin reference fails to disclose or suggest an immersible container being immersed in the liquid during a measurement of the property of the liquid.

The Rudkin reference discloses "a transducer for measuring a parameter of a fluid, such as density or viscosity." (Rudkin, Abstract). It is respectfully submitted that this transducer is not similar to the Martin reference. First, this transducer of Rudkin does not have a container with a cap or a base; rather, the transducer is mounted on a flange such as the wall of a pipe. (Rudkin, col. 1, ll. 28-30; col. 6, ll. 5-10,). Second, the piezo-electric elements are bonded inside a cavity and do not have contact with the liquid being measured. (Rudlin, col. 2, ll. 45-60).

The Rudkin reference does disclose using a shroud to surround the fork element. (Rudkin, col. 3, ll. 25-33). However, the Rudkin reference teaches that the motivation for using the shroud is to provide protection for the fork element "where foreign bodies within a metered fluid are likely to impact the tines." (Rudkin, col. 3, ll. 32-33).

Regarding the asserted combination of the teachings of Martin and Rudkin, it should be noted that the Martin reference discloses a non-immersible monolithic sensor with a base that completely isolates the liquid being measured from the surroundings. Since the base prevents liquid from flowing in or out of the base, there are no "foreign bodies." Therefore, there is no suggestion or motivation to include a shroud with fluid ingress and egress to offer protection against any "foreign bodies" as suggested by Rudkin. In fact, including such an orifice on the monolithic sensor may permit such foreign bodies to interfere with the TSM resonators. Thus, not only is there no need for such a modification, but such a modification would reduce the integrity of the sensor by allowing foreign bodies to enter the container. Therefore, there is no motivation to modify the Martin reference with the Rudkin reference as suggested by the Examiner.

The Schultz and the Igaki references do not overcome the deficiencies of the Martin and Rudkin references detailed above.

Since there is motivation to combine the teachings of the Martin, Rudkin, Schultz and Igaki references to arrive at the invention recited in Claim 1, these references do not render Claim 1 or its dependent Claims 2-5, 7, 9-11, and 13-19 obvious under 35 U.S.C. §103(a). It is, therefore, respectfully requested that this rejection be withdrawn.

Claim 6 stands rejected under 35 U.S.C. §103(a) as being unpatentable over the Martin reference as modified by the Rudkin, Schultz, and Igaki references, and further in view of Japanese Patent No. 06347339A to Kitsuta ("the Kitsuta reference").

As described above, the Martin, Rudkin, Schultz and Igaki references do not render obvioius Claim 1. The Kitsuta reference does not overcome this deficiency. Since Claim 6 depends from Claim 1, the Martin, Rudkin, Schultz, Igaki, and Kitsuta references do not render Claim 6 obvious under 35 U.S.C. §103(a). It is, therefore, respectfully requested that this rejection be withdrawn.

CONCLUSION

In light of the foregoing, Applicants respectfully submit that all of the pending claims 1-7, 9-11 and 13-19 are in condition for allowance. Prompt allowance of the present application is therefore earnestly solicited.

Respectfully Submitted,

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